

CLAIMS

1. A tuner comprising:

an input terminal operable to receive a high-frequency signal, the high-frequency signal including a first high-frequency signal and a second high-frequency signal, the second high-frequency signal having a level larger than a level of the first signal;

a first filter having an input port coupled to the input terminal, the first filter allowing a signal having the first frequency to pass therethrough and attenuating a signal having the second frequency;

a high-frequency amplifier coupled to an output port of the first filter;

a second filter having an input port coupled to an output of the high-frequency amplifier, the second filter allowing a signal having the first frequency to pass therethrough and attenuating the signal having the second frequency;

a local oscillator;

a mixer for mixing the output of the high-frequency amplifier with an output of the local oscillator;

an intermediate-frequency filter having an input port coupled to an output of the mixer; and

an output terminal for receiving an output of the intermediate-frequency filter.

2. The tuner of claim 1, further comprising a metallic case for accommodating the first filter, the high-frequency amplifier, the second filter, the local oscillator, the mixer, and the intermediate-frequency filter therein.

3. The tuner of claim 1, wherein the first filter is placed closer to the input terminal than the high-frequency amplifier is.

4. The tuner of claim 1, wherein an attenuation of the first filter at the second frequency is larger than an attenuation of the second filter at the second frequency.

5. The tuner of claim 1, wherein a transmission loss of the first filter at the first frequency is smaller than a transmission loss of the second filter at the first frequency.

6. The tuner of claim 1, wherein the first filter comprises:
a notch filter for attenuating a signal having the second frequency only; and
a low pass filter coupled in series to the notch filter, the low pass filter allowing the signal having the first frequency to pass therethrough and attenuating the signal having the second frequency.

7. The tuner of claim 1, further comprising a metallic partition plate for surrounding the first filter.

8. The tuner of claim 1, further comprising a wire for coupling the input terminal to the first filter, the wire having a length not greater than one eighth a wavelength of the first frequency.

9. A portable device comprising:

an antenna operable to receive a high-frequency signal, the

high-frequency signal including a first high-frequency signal and a second high-frequency signal, the second high-frequency signal having a level larger than a level of the first signal,

a tuner including

5 an input terminal coupled to the antenna,
 a first filter having an input port coupled to the input terminal, the first filter allowing a signal having the first frequency to pass therethrough and attenuating a signal having the second frequency,

 a high-frequency amplifier coupled to an output port of
10 the first filter,

 a second filter having an input port coupled to an output of the high-frequency amplifier, the second filter allowing a signal having the first frequency to pass therethrough and attenuating the signal having the second frequency,

15 a local oscillator,

 a mixer for mixing the output of the high-frequency amplifier with an output of the local oscillator,

 an intermediate-frequency filter having an input port coupled to an output of the mixer, and

20 an output terminal for receiving an output of the intermediate-frequency filter; and

 a transmitter section for transmitting the second high-frequency signal.

25 10. The portable device of claim 9, further comprising a case for accommodating the tuner and the transmitter section.

11. The portable device of claim 9, wherein the first filter and the second filter have passing frequency controlled according to the second frequency.

5 12. The portable device of claim 11, wherein each of the first filter and the second filter includes a variable capacitance diode.

10 13. The portable device of claim 9, further comprising a case for accommodating the second filter, the local oscillator, the mixer, the intermediate-frequency filter, and the transmitter section, the case not accommodating the antenna, the input terminal, the first filter, or the high-frequency amplifier.

15 14. The portable device of claim 13, further comprising a shield case for accommodating the first filter and the high-frequency amplifier.

15 15. The portable device of claim 14, wherein a distance between the antenna and the first filter is shorter than a distance between the high-frequency amplifier and the input terminal of the tuner.